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ABSTRACT

This paper begins by presenting three tests, which are included in the appendix, of one's awareness of physical risks. This exercise leads to a discussion of the differences between actual and perceived risk, why people participate in outdoor activities, and the inaccurate perception of actual risks. Complicating the issue of accurately perceiving physical risks are sociological, psychological, and physiological factors that affect judgment and decision making in the field. These factors and their effects are discussed. If participants fail to perceive the risks in an activity, they are less likely to take adequate precautions. In addition, liability issues surround the "voluntary assumption of risk." Furthermore, if leaders or participants have an inaccurate perception of risk, they obviously cannot make-high quality decisions. "Common sense" is a learned skill, therefore it is not common among beginners. Educators and leaders should not rely upon common sense but should teach and employ "good sense." Teaching judgment, decision making, and good sense requires teaching an accurate perception of risks. Good judgment and decision making require that leaders be aware of, and adjust for, the ways beginners perceive risks differently from experienced participants and that they factor in the sociological, psychological, and physiological factors affecting judgment. Contains 15 references. (TD)

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ACTUAL RISK AND PERCEIVED RISK: IMPLICATIONS FOR TEACHING JUDGEMENT AND DECISION-MAKING TO LEADERS

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ABSTRACT

This talk used published data and literature on actual risk and perceptions of (physical) risk and summarizes literature on why people participate in outdoor activities. It discusses the inaccurate perception of the actual risks.

Complicating the issue of accurately perceiving physical risks is that there are a number of sociological/psychological and physiological factors which, in the field, affect judgment and decision-making. These factors and their effects are discussed. If persons fail to perceive the risks in an activity, then they are less likely to take adequate precautions. There are liability issues as well surrounding the "voluntary assumption of risk." Furthermore, if leaders or participants have an inaccurate perception of risk, then they obviously cannot make high-quality decisions.

A subsidiary major point of this presentation is that "common sense" is not that common among beginners. Our job as educators and leaders is not to rely upon "common sense," but to teach and employ "good sense."

Teaching judgment, decision-making, and good sense requires teaching an accurate perception of risks. Good judgment and decision-making requires that leaders be aware of, and adjust for, the ways beginners perceive risks differently from experienced participants and that they factor in the sociological/psychological and physiological factors affecting judgement.

INTRODUCTION

Audience Perception of Risks

The presentation started by giving the audience three assessments of their awareness of risks. The three tests involved ranking: a) the risk of death from different causes; b) primary and secondary urban children's fears of nature centers; and c) fears of persons about to go through an Outward Bound course (see Appendix for the tests, with answers supplied). After each test, audience members assessed the accuracy of their perceptions.

The audience found they were generally accurate with respect to death rates from different causes (typical average variance from the correct answer = less than 2). However, there much less accurate with respect to urban children's fears (average variance = 4) and to fears of Outward Bound students (average variance = about 5.5)

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Statistics on actual (physical) risk

The audience were then shown data from two other sources (Smoot, 1993; Hale, 1990; see Appendix) and involved in the discussion. A few key points entailed

by the data and from other (non-cited) information were brought out. Some of them were these:

- Generally people have a perception of rock climbing as being dangerous. Consequently it is relatively easy to get students to take adequate safety precautions (except perhaps for the use of helmets).
- Moving water is fairly dangerous, yet participants under-perceive the danger; consequently, they are less willing to take pre-cautions.
- Generally, activities which are belayed (high ropes, top-rope climbing), even though scary, are safer than unbelayed activities close to the ground (low ropes, backpacking, New Games, sports).
- Traditional sports (soccer, baseball, volleyball, etc.) are about four times more dangerous than outdoor "risk" activities.
- Urban people are much more likely to have a fear of things such as bees, bears, insects, than of the more real dangers (hypothermia, lightning, dehydration, moving water).
- Staff are more likely to be injured than participants.
- Driving is generally the most dangerous aspect of outdoor recreation. A "risky" driver is about 10x more dangerous than a safe driver.
- Social fears are a significant source of fear (perceived risk), and often stronger than physical fears.

After the introductory activities and discussion, the following was presented.

PERCEIVED RISK & ACTUAL RISK

Definition and a Confusion

For the purpose of this presentation, perceived risk is defined to be the risk as perceived by the participant. This may be an accurate perception, or it may be inaccurate. A participant may perceive an activity to be risky when, statistically, it is safe; or they may perceive an activity to be risky when actually it is risky.

Some of the literature (e.g., Loynes, 1995) defines "perceived risk" to be only that which is perceived to be risky, when actually it is (relatively) safe. The conception of "perceived risk" used in this paper is different from the conception in some of the literature.

REASONS PEOPLE PARTICIPATE IN (LOW-RISK) OUTDOOR RECREATION

(Backpacking, camping, picnicking, fishing, xc skiing, snowmobiling)

There are a number of studies which have investigated why people participate in low-risk outdoor recreation activities such as backpacking, camping, picnicking, fishing, xc skiing, snowmobiling. From these studies, I suggest that the following seem to be the major overall reasons people participate in these activities:

Enjoyment of nature
Physical Fitness
Tension Reduction
Escape, Rest
To be with Friends and Family
Excitement
Trying something new
Outdoor learning
Exploration

One interesting finding is that snowmobilers participate in their activity for most of the same reasons that cross-country skiers participate in their activity.

Based upon an examination of these studies, I suggest the following key points can be gleaned from the research.

Key Points from Literature

- Generally, risk or excitement is not a major reason people participate in outdoor recreation. Furthermore even for those who engage in risky outdoor recreation activities, risk or excitement may or may not be a reason.

- Generally, skill or difficulty (testing one's ability) is not a major reason for non-leaders. In contrast, skill or difficulty is often a reason leaders participate.

- Why a person participates probably varies with the activity. (That is, some activities are more conducive to specific values-- snowmobiling is more conducive to excitement than is picnicking.)

- There are often extrinsic reasons people participate (Ford & Blanchard, 1993, p. 9). There is often social encouragement (perhaps pressure) from friends or leaders of their social group.

- Often people do not participate in risk activities for the same reasons a beginning leader may do so. (People who participate in risk activities probably do not have a complete picture of the activity. Often they may be participating merely for the reasons cited above.)

REASONS EXPERIENCED RISK TAKERS PARTICIPATE IN (HIGH) RISK ACTIVITIES

In contrast, those who participate in risk activities participate for generally different reasons. They participate for the following reasons:

Physical fitness; healthy leisure activity
Concentration
Tension release
Testing abilities, personal achievement
Being with friends
Excitement (endorphins)
Challenge/ uncertainty
Nostalgia -- Chance to reminisce

Some people claim that the adrenaline rush is extremely important. Others compare the concentration required in risk activities (often called a "flow" state) to be similar to that of a chess player (or someone observing art). These persons are getting a psychological "high" (which may have a physiological base in endorphins; see for example, Jones & Ellis, 1996).

However, others say that the component of the adrenaline high is over-rated. They say that social reinforcement and peer respect, a sense of self-respect and self-accomplishment are equally, or more, important. Probably, which aspect is more important depends on the individual.

Persons who engage in traditionally high-risk activities can engage in them at a lower level of risk. A Class V boater might "retire" from Class V boating to spend more time on Class III waters; a 5.9 rock climber may choose to limit herself to climbs previously done or to easier rock. These experienced risk takers may fall more in the category of the "low-risk" practitioner.

Within any group of beginners who participate in outdoor risk activities, you will probably find all the reasons cited for both the low risk participants and the high risk participants. However, even for those beginners who participate

for the high-risk reasons, the level of difficulty or danger needed to achieve the benefits will be generally much less than for the experienced participant.

The Experienced Risk Taker and Acceptable Risk

Those who don't participate in risk activities tend to believe that experienced risk-takers (ERTs) are dare-devils participating without regard for their life or health. Nevertheless, statistics indicate that experienced practitioners of a risk activity are probably less likely to be injured or killed than are beginners in the activity.

It has been suggested that the experienced risk taker does a "cost/benefit" analysis to determine how much risk is acceptable (Helms, 1983). Yes, they are engaging in a risky activity, but they are not dare-devils; rather they are carefully weighing the odds and making conscious decisions regarding their safety. Under cost/benefit analysis, the ERT is doing "more" "risky" activities to achieve the same benefits a less experienced person would achieve. In one sense, the risks may be more risky; but because the ERT's skill level is higher, chances of injury or death is often much less than for the inexperienced person.

Thus, ERTs are not necessarily more risky, they are just perceived so by the less-experienced. Through cost/benefit analysis they are attempting to limit themselves to "acceptable risk." However, there are sociological/psychological factors, discussed later, which do affect their perception of the risk. Experienced risk takers do make mistakes, and if they are pushing the extremes, their mistakes are more likely to be serious or fatal.

Many people who are training to be leaders of outdoor risk activities tend to be experienced risk takers. These does not mean they are necessarily pushing the extremes, but is does mean they are likely to be participating in risk activities for different reasons than at least some of the beginners; further, they will probably be engaging in the activity at a higher level of difficulty than a beginner could as safely participate.

For these reasons, there are a number of key points which beginning leaders need to understand.

Key Points for Beginning Leaders

- Many beginning leaders tend to be experienced risk takers; however, most beginners are not.

- Beginners who engage in risk activities may not engage in them for the same reasons that the experienced risk taker (and the beginning leader) does.

  Often beginning participants engage in those activities for the same reasons that they might engage in outdoor recreation generally, namely perceived benefits such as physical fitness and the accompanying tension reduction, enjoyment of nature, escape and rest, outdoor learning, and exploration.

  Beginners often cannot fully realize the differences between risk activities and other activities. They may just be "trying out" the activity to see if they like it.

- The level of risk which is appropriate to the beginner is generally much less than that needed by the experienced risk taker.

SOCIAL/PSYCHOLOGICAL FACTORS AFFECTING JUDGMENT OF ACCEPTABLE RISK

There are a number of factors affecting the evaluation of what is "acceptable risk," i.e., affecting judgment. Helms (1983) discussed many of these.

AGE -- Young men are generally more confident that older men; this difference does not occur in women.

In some activities, the average time of active participation in a high-risk activity seems to be about five years (Withers, 1988, p. 75). They then tend to retire to less risky activities. The feeling of invulnerability tends to diminish; close calls and injuries/deaths of friends take effect.

SELF-CONFIDENCE -- People with higher self-confidence tend to engage in riskier behaviors. If the self-confidence is too high, the confidence may be misplaced and be over-confidence.

EXPERIENCE -- Generally, people with more experience are more capable of accurate judgements.

IGNORANCE/ INEXPERIENCE -- It is well known that inexperienced and ignorant persons are much more likely to have poor judgment.

INVULNERABILITY -- High risk takers tend to be unaware of the consequences; they tend to have the feeling of invulnerability. This is also a characteristic of youth.

LOW SELF-CONCEPT -- People with low self-esteem may also engage in riskier behavior in order to demonstrate their bravery, or they may be very conservative. People with high self-concept tend to be moderate risk-takers.

(Notice a difference between self-confidence and self-concept. I suggest that people with mis-placed self-confidence can have an inaccurate view of self and others' capabilities.)

RISK TAKING AS A CULTURAL VALUE -- Risk taking behavior is a valued (male) trait in our society.

GROUP BEHAVIOR -- When making decisions as part of a group, there are a large number of factors interacting which push individuals in groups to make decisions different from what they would make as individuals.

One typical example is the "Risky Shift." Groups functioning in a "risky shift" mentality tend to make more risky decisions, because each individual is abrogating some responsibility to others in the group. On the other hand, a group may also be unnecessarily conservative, because no one wants to be responsible for being too risky.

Another problem in groups may be the tendency to assume that the confident, outspoken person is correct and to go along with that person. That confident person may merely be over-confident (see above). Peer pressure and its well known effects may come under this category. There is a tendency for people to "egg" each other on; to say, "Go for it."

There are many other influences as well. (For examples, see Johnson & Johnson, 1997). *Small group behavior is outside the scope of this presentation.*

As a leader of a group, it is important to remember that a well-functioning group tends to make high-quality decisions; but the catch is in the "well-functioning" aspect. A well-functioning group takes into account, and adjusts for, those group pressures. If as a leader you are trying to give the group responsibilities, you still need to be monitoring the group and its decisions and ascertaining the quality of the decisions.

As a leader, for a particular decision you need to ask yourself, "Is the group well-functioning?" and if so, "Does it have the necessary capability of making <u>this</u> decision correctly and in implementing the decision?" As a leader, you need to be able to recognize what is going on in the group, and

for crucial decisions, you may need to make the decision not to give responsibility and decision-making authority to the group (for that crucial decision).

HAZARD FOLKLORE -- Within a given outdoor community, there many be a certain "folklore" or peculiarly local perception of risk surrounding a local outdoor undertaking. A certain route on a mountain or rapid on a river may be perceived to be especially risky, an animal (black bears?, cougars?, bigfoot?) may be perceived to be especially dangerous in the area. A certain style of equipment or technique may be perceived as dangerously inappropriate. Sometimes it make take an outsider to come in and dispel the myth.

For example, many years ago when I moved to a specific community in one state from another outdoor community (only 120 miles away), I was told that the pin-binding cross-country skis I was using for winter camping were completely useless. This was a surprise to me because I and my friends had been using them successfully for two years in the same mountain range.

FASHION -- Related to hazard folklore is fashion. Fashion concerns affect both standard safety practices and equipment. In the U.S., the rock-climbing community generally does not wear helmets. Many assert that helmets increase the hazard. Nor do U.S. climbers wear chest harnesses.

Twenty-five or so years ago, it was considered to be unsafe to wear life-jackets when whitewater boating. Currently, some in the alpine skiing industry are working to make helmets for skiing fashionable. Teenagers are notoriously susceptible to fashion-- it can be difficult to get them to wear life jackets, helmets, or even the proper clothing. Much outdoor equipment is fashion driven-- a "purely" functional piece of equipment is difficult to market.

TIME AND EXPOSURE TO RISK -- Often, people who are more used to risk, exposed to it more often or for a period of time feel less threatened by the risk. Consequently, they are more likely to take risks.

BETTER EQUIPMENT AND SAFETY/RESCUE TECHNIQUE -- Its well recognized that with better equipment, people have the illusion of safety. This is especially a problem in whitewater rafting with the advent of self-bailing rafts. Rafting companies are routinely taking customers down rivers they would not go down 10-15 years ago. And customers are dying. As safety equipment develops, people take greater risks.

SOCIETAL PRESSURE / ADVERTISING -- Currently, advertisements on TV and in print are pushing the high risk activities. One successful company's slogan is "Just Do it." Risk activities are the rage. One first-year leadership student of mine said he highly valued "a reckless disregard for the consequences" in his participants.

A NEED FOR CHALLENGE AND SUCCESS -- The outdoor recreation/ adventure education industry recognizes and exploits the fact that risk activities provide both challenge and success. Many participants, especially beginners and beginning leaders, find it difficult to turn back or quit if they are close to a goal or have invested considerable time or money in a project.

ADRENALINE RUSH/ FLOW STATE/ A "HIGH" -- As briefly discussed earlier, participants can achieve a "flow" state or a high. Some develop such a need for this high that they will unreasonably push themselves to participate. For example, a few years ago, a friend of mine could not quit her daily run, even though she had mononucleosis.

ON & OFF DAYS -- People have on and off days. When they are "on", they tend to feel invincible. A few years ago, the whitewater kayaker and co-author of a river rescue text, Slim Ray, was having an especially "on" day until

the drop which broke his back and paralyzed him. It is difficult to hold back when one is having an especially good day.

Conversely, if someone is having an "off" day, there is a tendency to persist because one knows one is capable of doing better.

PERSONALITY TRAITS -- Helms (1983) concludes that, by themselves, personality traits are not a good predictor of risk taking propensity within a given situation. That a person is "warrior-like" or excitable does not necessarily predispose a person to take a risk. Other factors, such as previous experience and perception of the hazard and perceived utility of the goal, interact. It may be that the risk or difficulty is not perceived to be high enough to be worth the effort. Risk taking itself is not a personality trait (p. 249-250).

ENVIRONMENTAL/PHYSIOLOGICAL FACTORS

There are a number of environmental and physiological factors which affect judgement. Since they are fairly well known by practitioners, I will discuss them in summary fashion.

HYPOTHERMIA -- Of these factors, hypothermia is considered to be the most insidious. It is well recognized that judgement is affected very early in the onset of hypothermia. Hypothermia is also a significant contributing cause of accidents.

DEHYDRATION -- Dehydration also tends to have subtle and early effects on a person. A typical early sign of dehydration is irritability and a subsequent unwillingness to listen to reason or think rationally.

HUNGER -- Some people need to have food on a regular basis (this may be due to a lower blood sugar). As with dehydration, being forced to delay lunch can cause irritability and subsequent unwillingness to listen to reason.

Hale's (1990) studies of accidents found that there was a noticeably greater accident rate in the late morning and the late afternoon. This is likely related to hunger and/or fatigue.

FATIGUE -- It is recognized that a significant proportion of climbing accidents occur on the descent, even though frequently descents occur on easier, safer routes. Fatigue is not only a cause of accidents, but it affects judgement as well. Further, it is difficult to take into account the effects of fatigue when making judgments.

ALTITUDE/ INJURY/ HEAT -- As we know, these three also can affect judgement significantly.

IMPLICATIONS RESULTING FROM THE LITERATURE

So far we have presented data and literature comments on actual risks and the perception of risk. In addition to ignorance of actual risks there are also sociological/ psychological factors affecting the perception of, and judgments concerning, risks. Given this information, a number of conclusions important for beginning leaders can be drawn.

- There is often no correlation between real risk and perceived risk for participants and/or, often, beginning leaders.

- A lack of knowledge of actual risk by leaders makes activities more hazardous. It is a major responsibility of leaders to:

  -- eliminate all unnecessary, unacceptable risk
  -- be able to recognize and forestall actual risks.

- Leaders need to be able to anticipate and alleviate unwarranted fears in participants. Participants with unwarranted fears may fail to perceive actual risks.

- Participants who do not accurately perceive risks will tend to be more careless or more dangerous.

- Participants can not voluntarily assume risks if they can not accurately perceive them.

- To learn judgment and decision-making, participants must learn to distinguish actual and perceived risks. This is a first step in learning judgment.

- Because there is so little accurate data on the actual risks, insurance rates are often based on perceived risks. These rates may not correspond with the actual risks.

LEARNING TO ASSESS ACTUAL RISK

There are many ways to go about learning to assess risk accurately. These have been well-covered elsewhere. However, my observation has been that many students are reluctant to learn by means other than personal experience and making mistakes. (This is undoubtedly related to lack of experience and the feeling of invulnerability mentioned earlier.) Nevertheless, following are alternative sources of information.

STATISTICS AND ACCIDENT REPORTS -- Two excellent sources of information are the American Alpine Club's annual accident report and the American Canoe Association's accident reports. There is much to be learned from reading these sources. The Wilderness Risk Managers Committee and the Association of Experiential Education are working together to gather additional information. Further, there are avalanche accident reports and data.

CLASSES/ BOOKS/ NEWSPAPERS/ MAGAZINES/ JOURNALS -- These are all excellent sources.

TALK TO PEOPLE -- Outdoor stores, clubs, people you meet along the trail or river are all excellent sources of information. In many places, rangers and game wardens are knowledgeable source.

PERSONAL OBSERVATION OF EXPERIENCE; REFLECTION -- This is an excellent source of learning. However, it must be objective, reflective, and critical observation; and that can be difficult. Merely going out and having experiences is not necessarily an efficient source of learning. What must be combined with the experience is critical reflection. This is why journals and talking about experience and your learning (debriefing) is important. To many beginning leaders, the reflection part is too much like work, and is less fun than the "doing." Nevertheless, it is the important part of the experience for the experience to be experiential learning.

It is often thought that good judgement can be learned only through experience. This is not true. Experience alone is insufficient; critical thinking and reflection upon the experience is also necessary. So is theoretical knowledge.

Furthermore, the effective learner acquires good judgment not only through one's own experience and mistakes, but from the experience of others as well. This may be summarized by the epigram:

> "It's often better to learn from the mistakes of others than to suffer through your own."

SUMMARY; KEY POINTS

- We are not trying to eliminate risk, rather to "manage" it to acceptable levels. What is acceptable to a person as a leader must be more conservative than for a person doing it on their own.

- For participants, there are also physical risks and social/ psychological risks. Leaders need to be aware of more than just the physical risks.

- It is often difficult for the instructor to know when a student is fearful or how fearful.

- For physical risks, there is a often a distinction between actual and perceived risk. For the experienced leader, this is minimal.

  Beginning leaders and participants need to learn to reduce the difference between actual and perceived risk.

- We are concerned with an accurate objective evaluation of risk. This is essential for learning judgment & decision-making (J/DM)

- Sufficient theoretical knowledge about actual risks is often a limiting factor.

  -- the beginning leader needs to make a full effort to become informed.

  -- leaders need to keep up to date on the latest information and need to know where to find it.

- There are sociological/ psychological factors affecting judgment of risk; there are physiological factors affecting judgment.

  The leader needs to be aware of these and be able to adjust for these.

- Despite this discussion of risk, any experienced, competent, outdoors person is far safer when doing these "risks" than when driving a car!

FINAL OBSERVATIONS and CONCLUSIONS

It's extremely important to realize that good judgment is a learned skill. Although some people may pick it up faster than others and pick it up without formal instruction, *people are not born with good judgment*.

A number of authors feel "common sense" is important to good judgment and decision-making (J/DM). The problem with believing in the value of "common sense" is that what is "common sense" for the beginner may be foolish for the experienced person. Conversely, what is common sense for the experienced leader may not be obvious to the beginner. ***These are the main points of this presentation.***

What leaders need is "good sense." As with so much of J/DM, good sense is a learned skill. It is not as common in beginners or beginning leaders as we would like, nor can we expect or assume them to have it.

AUTHOR NOTE:

Comments and questions are encouraged. During the presentation, overheads for Key Points were used. A number of participants asked for the material to create these overheads. They are available at no charge. The author may be contacted at: Unity College, Outdoor Recreation Leadership program, Unity, ME 04988. Phone: (207) 948-3131, x213. Fax: (207) 948-6277.

This presentation was based upon a number of articles and bits of information collected over several years. Following are some references which have been consulted.

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APPENDICES

PERCEPTIONS OF RISK

Death Rates

The following are causes of death in the United States (US), the United States and Canada (US&C), or world-wide (WW). As a group, please assign each a rank according to the total number of deaths which occur each year. (1 = highest; 15 = lowest)

YOUR ANSWER		CORRECT ANSWER	DIFF.
_____	lightning (US&C)	7.5	_____
_____	mountain and rock climbing (US&C)	12	_____
_____	cardiovascular disease (US)	1	_____
_____	bees (US)	7.5	_____
_____	downhill skiing (US)	10.5	_____
_____	bears (US&C)	15	_____
_____	vehicular accidents (US)	2	_____
_____	homicide (US)	3	_____
_____	challenge courses (US)	14	_____
_____	skin cancer (US)	4	_____
_____	commercial airplane accidents (US)	10.5	_____
_____	livestock (being trampled, gored) (WW)	6	_____
_____	canoeing and kayaking (US)	9	_____
_____	snakebite (US)	13	_____
_____	heatstroke (US)	5	_____

TOTAL DIFFERENCE (VARIANCE): _____

AVERAGE VARIANCE: _____

[Note: When administering this exercise, it is recommended you <u>not</u> have the answers available to group members.]

<u>Disclaimer</u>: The data for these answers have been collected from a wide variety of sources over a few years. Some of the answers differ depending on the source of the data.

PERCEPTIONS OF RISK

Urban Children's Fears (of nature centers)
(Primary and Secondary)

The following are fears of urban children. As a group, please rank them from the greatest fear to the least fear. (1 = high; 14 = low)

YOUR ANSWER		CORRECT ANSWER	DIFF.
_____	nighttime	14	_____
_____	ticks	9	_____
_____	weather	10	_____
_____	bee stings	6	_____
_____	personal comfort (cold, heat, fatigue)	7	_____
_____	getting dirty	5	_____
_____	snakes	1	_____
_____	bird attacks	13	_____
_____	bears	4	_____
_____	being in the woods	8	_____
_____	water (falling in; getting wet)	12	_____
_____	getting lost; not returning	3	_____
_____	insects	2	_____
_____	people (weird, crazy)	11	_____

TOTAL DIFFERENCE (VARIANCE): _____

AVERAGE VARIANCE: _____

[Note: When administering this exercise, it is recommended you <u>not</u> have the answers available to group members.]

<u>Disclaimer</u>: The answers here have been extrapolated from the data and may appear to be somewhat different from the original. Effort has been taken to present the answers as an accurate reflection of the original report. This is not a research instrument.

Source: Bixler et al. (1994). <u>Journal of Environmental Education</u>.

FEARS IN OUTWARD BOUND

The following are fears of Outward Bound participants prior to their program. Please rank them from the greatest fear to the least fear. (1 = high; 17 = low)

YOUR ANSWER		CORRECT ANSWER	DIFF.
_____	fast water / deep water	17	_____
_____	not enough to eat	1	_____
_____	bothered by insects	3.5	_____
_____	insufficient strength/experience	13.5	_____
_____	falling	5	_____
_____	becoming lost	9.5	_____
_____	letting others down	2	_____
_____	dirty	9.5	_____
_____	lack of privacy	13.5	_____
_____	poisonous plants	15	_____
_____	darkness	16	_____
_____	not fitting in	3.5	_____
_____	letting self down	8	_____
_____	poisonous animals	12	_____
_____	confrontation w/ others	11	_____
_____	making wrong decisions	6	_____
_____	inadequate clothing or training	7	_____
		TOTAL DIFFERENCE (VARIANCE):	_____
		AVERAGE VARIANCE:	_____

MISCELLANEOUS

T F In Outward Bound and NOLS, the injury rate in backpacking is higher than in rock climbing. (Wilderness Risk Managers' Conference, 1994)

T F In challenge courses, high elements have more injuries than low elements. (Hale; Project Adventure)

[Note: When administering this exercise, it is recommended you not have the answers available to group members.]

Disclaimer: The answers here have been extrapolated from the data and may appear to be somewhat different from the original. Effort has been taken to present the answers as an accurate reflection of the original reports. This is not a research instrument.

Source: Ewert, A. (1986). J. of Environmental Education.

ESTIMATED ACCIDENT AND FATALITY RATES (1993)*
(Per 100,000 participants, US data)

Activity	Injuries	Deaths
Mountaineering (8000m peaks)	5,000+	4000+
Paragliding	5,900+	400+
BASE jumping	5,000+/-	300+/-
Mountaineering (Denali)	1,368	398
Mountaineering (general)	602	146
"Mountain Climbing" (all types, incl. rock climbing)	320	45
Mountaineering (Mt. Rainier)	341	24
Skydiving	30+/-	24
Hang gliding	500+	22
Automobiles (drivers/passengers	2,100+	19.1
Mountaineering (North Cascades)	98	18.6
Rock climbing (Yosemite)	400+	18.3+
Boating (small craft--includes rafting, kayaking, canoeing, small motorboats and rowboats(	500+/-	14.5+/-
Rock climbing (Smith Rock)	250+	10+/-
Rock climbing (in general)	198+/-	8+/-
Caving	200+	6+/-
Surfing	154	4+/-
Diving (scuba, recreational)	70+	3+/-
Swimming	170+	2.5
Boating (recreational--includes large motorboats, yachts)	125+/-	2.5+/-
Rock climbing (Eldorado Canyon)	27+	2+/-
Skiing (Alpine?)	1,440+/-	2+/-
Bicycling	1,049+	1.7
Rock climbing (Gunks)	100+/-	1+/-
Hiking	50+/-	0.5+/-
Football	2,857	0.05
Commercial airline transportation	1+/-	0.05
Lightning	0.015	0.0016

A large percentage of accidents are not reported. For most activities, the actual injury/ accident rate is much higher. Indoor "rock" climbing is not assessed here.

* Smoot, J. (1993). Is climbing really dangerous? Rock and Ice, #58, p. 58.

SERIOUS INJURY RATE* (1989**)
(per million participant hours)

Non-Activity Time (participants)	0.15
High Ropes Course (participants)	0.55
Initiative/Team challenge (participants)	0.60
Participant Injury, all activities	1.01
Overall injury rate, all database	1.08
Staff injury	1.73
Canoeing (participants; includes flat water, portaging)	2.90
Backpacking (participants)	5.44
Rockclimbing (participants)	7.30
Day Hiking, Orienteering (participants)	7.77
Downhill Skiing (participants)	8.75
X-Country Skiing (participants; includes backcountry skiing)	9.97
Sports and Recreation (participants; includes soccer, volleyball, softball, New Games, etc.)	31.90

* Serious Injuries = injuries requiring physician's treatment, or causing person to miss a half-day of activity, or indicating long term complications.

** Hale, N. (1990). Annual Review - 1989. Bellefontaine, OH: National Safety Network.